

1 I claim:

1. A connection, comprising:
 - a. an elongated tension member, having first and second ends, said elongated tension member being anchored at said second end;
 - 5 b. a fastening member attached to said elongated tension member at said first end;
 - c. a resisting member that receives said elongated tension member and is disposed between said fastening member and said second end of said tension member;
 - 10 d. an expansion device that receives said elongated tension member there through and is compressively loaded between said fastening member and said resisting member by operation of said fastening member on said elongated tension member, said expansion device comprising,
 - 15 1. a surrounding sleeve, having two ends, and a central aperture through which said elongated tension member is inserted, wherein a portion of said central aperture is formed as a substantially cylindrical inner surface and wherein at least a portion of said cylindrical inner surface is formed with a thread;
 - 20 2. first and second bearing members received in said central aperture of said surrounding sleeve and operatively connected to said surrounding sleeve, said first and second bearing members also having apertures through which said elongated tension member is inserted, and wherein at least one of said bearing members has a cylindrical outer surface formed with a thread that mates with said thread of said cylindrical inner surface of said surrounding sleeve and is connected to said surrounding sleeve only by the mating attachment of said thread on said cylindrical outer surface with said thread of said surrounding sleeve, such that said at least one bearing member can rotate in relation to said surrounding sleeve, and said first and second bearing members are formed with outer axial ends that protrude out of said surrounding sleeve, said outer axial end of said first bearing member contacting said fastening member, and said outer axial end of said second bearing member contacting said resisting member; and

- 1 3. a torsion spring connecting said first and second bearing members, said torsion spring biasing said first and second members in opposite rotational directions such that said at least one of said bearing members is forced to rotate along said
- 5 thread of said surrounding sleeve away from said other bearing member and out of said surrounding sleeve, said torsion spring being disposed within said surrounding sleeve.
- 10 2. The connection of claim 1, wherein:
both of said bearing members have cylindrical outer surfaces formed with threads that mate with said thread of said cylindrical inner surface of said surrounding sleeve, and both of said bearing members are connected to said surrounding sleeve only by the mating attachment of said threads on said cylindrical outer surfaces with said
- 15 thread of said surrounding sleeve, such that both of said bearing members can rotate in relation to said surrounding sleeve.
- 20 3. The connection of claim 1, wherein:
 - a. said elongated tension member is at least partially formed with a thread where said fastening member attaches to said elongated tension member;
 - b. said fastening member attaches to said elongated tension member by means of an internal thread that mates with said thread of said elongated tension member; and
 - 25 c. said thread of said surrounding sleeve is threaded in the opposite direction as said thread of said elongated tension member.
- 30 4. The connection of claim 1, wherein said expansion device further comprises:
an inner sizing sleeve that is received by said surrounding sleeve and is disposed between said torsion spring and said elongated tension member.
- 35 5. The connection of claim 1, wherein said expansion device further comprises:

1 a locking clip that is releasably attached to said expansion device, said locking clip holding said first and second bearing members so as to prevent them from rotating under said influence of said torsion spring and causing said device to expand.

5

6. The connection of claim 1, wherein said expansion device further comprises:

a pair of annular seals disposed at said ends of said surrounding sleeve to protect said thread of said surrounding sleeve.

10

7. The connection of claim 1, wherein:

said thread of said surrounding sleeve near at least one of said ends of said surrounding sleeve is disturbed so that it is not possible for a bearing member traveling on said thread to pass all the way out of said surrounding sleeve.

15

8. The connection of claim 1, wherein:

a. said torsion spring is formed with first and second ends; and
b. said first and second bearing members are formed with annular recesses that can receive said ends of said torsion spring so that expansion device can be made more compact.

20

9. The connection of claim 1, wherein:

a. said elongated tension member has first and second ends and said fastening member, resisting member and expansion member are disposed near said first end; and
b. said second end of said elongated tension member is connected to a structural member in a building.

25

30 10. The connection of claim 9, wherein:

said building has a structural frame at least a portion of which is made from wood.

11. The connection of claim 2, wherein:

35 said thread of said surrounding sleeve near at least one of said ends of said surrounding sleeve is disturbed so that it is not possible for a

1 bearing member traveling on said thread to pass all the way out of said surrounding sleeve.

12. The connection of claim 11, wherein:

5 a. said torsion spring is formed with first and second ends; and
b. said first and second bearing members are formed with annular recesses that can receive said ends of said torsion spring so that expansion device can be made more compact.

10 13. The connection of claim 12, wherein:

a. said elongated tension member is at least partially formed with a thread where said fastening member attaches to said elongated tension member;
b. said fastening member attaches to said elongated tension member by means of an internal thread that mates with said thread of said elongated tension member; and
15 c. said thread of said surrounding sleeve is threaded in the opposite direction as said thread of said elongated tension member.

20 14. The connection of claim 13, wherein said expansion device further comprises:

an inner sizing sleeve that is received by said surrounding sleeve and is disposed between said torsion spring and said elongated tension member.

25

15. The connection of claim 16, wherein said expansion device further comprises:

30 a locking clip that is releasably attached to said expansion device, said locking clip holding said first and second bearing members so as to prevent them from rotating under said influence of said torsion spring and causing said device to expand.

16. The connection of claim 15, wherein said expansion device further comprises:

35 a pair of annular seals disposed at said ends of said surrounding sleeve to protect said thread of said surrounding sleeve.

- 18 -

1

17. The connection of claim 2, wherein:

 said torsion spring connects to said first and second bearing members near said outer axial ends of said bearing members.

5

18. The connection of claim 1, wherein:

 said thread of said surrounding sleeve near at least one of said ends of said surrounding sleeve is disturbed so that it is not possible for a bearing member traveling on said thread to pass all the way out of said surrounding sleeve.

10

19. The connection of claim 18, wherein:

 said torsion spring connects to said first and second bearing members near said outer axial ends of said bearing members.

15

20. The connection of claim 19, wherein said expansion device further comprises:

 an inner sizing sleeve that is received by said surrounding sleeve and is disposed between said torsion spring and said elongated tension member.

20

25

30

35